

REMARKS

The Applicants respectfully request further examination and reconsideration in view of the above amendments and arguments set forth fully below. Claims 1, 8, 10, 12-14, 16, 17, 19, 29-32, 38, 40, 41, 44, 128-130 and 132-135 were pending. By the above amendments, Claims 1, 132, 134 and 135 have been amended and Claim 133 has been canceled. Accordingly, Claims 1, 8, 10, 12-14, 16, 17, 19, 29-32, 38, 40, 41, 44, 128-130, 132, 134 and 135 are currently pending.

Claim Rejections Under 35 U.S.C. §112

Within the Office Action, Claims 1, 8, 10, 12-14, 16, 17, 19, 29-32, 38, 40, 41, 44, 128-130 and 132-135 have been rejected under 35 USC 112 for failing to point out and particularly state the claimed subject matter. Specifically, it is asserted that the limitation in claim 1 that the fluid flow from the first of the one or more fingers to the second of the one or more fingers ... appeared to be in conflict with applicant's prior statements (explaining that 118A could be the first finger that is not parallel to the second finger 118B or 118C) ... because first finger 118A does not conduct fluid flow to second fingers 118B and/or 118C. It is then asserted, that an explanation of this conflict defining element 116 as the first finger and elements 118 as the second fingers does not solve this problem because the previous interpretation has not been repudiated and the use of element 116 as a "finger" conflicts with its description as "channel" in the original disclosure.

In response, the Applicants hereby repudiate the previous interpretation in favor of this newly presented one. Support for the first finger and second finger being 1) non parallel to a portion of each other and 2) enabling fluid to flow from the first finger to the second finger is found with the Specification by interpreting fingers 118B and 118C as the first and second fingers or vice versa. In particular, looking at Figure 3A, if the cavity abutting the channel 116 is attributed to finger 118B, then finger 118B is able to be the first finger wherein fluid is able to flow from "first" finger 118B to "second" finger 118C at the point where finger 118B turns to face the negative Y direction and finger 118C continues in the negative X direction (before eventually turning in the negative Y direction as well. Similarly, if the cavity abutting the channel 116 is attributed to finger 118C, then finger 118C is able to be the first finger wherein fluid is able to flow from the "first" finger 118C to the "second" finger 118B at the point where finger 118B branches off of finger 118C in the negative Y direction. Thus, in either

interpretation fluid is able to flow from the “first” finger to the “second” finger. Further, in either interpretation portion of the first finger are non-parallel to portions of the second finger. Thus, there is support for both limitations without requiring conflicting interpretations.

Additionally, with regard to Claim 135, it is asserted that the terms “outlet finger” and “plurality of outlet fingers” do not have precise antecedent basis. By the above amendments, the above terms have been deleted.

Within the Office Action, Claims 132, 133 and 135 are rejected under 35 USC 112 as failing to comply with the written description requirement. Specifically, it is stated that fluid flow is not disclosed. By the above amendments, the claimed fluid flow has been removed from Claims 132 and 135 and Claim 133 has been canceled.

Claim Rejections Under 35 U.S.C. §103

Within the Office Action, Claims 1, 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132-135 are rejected under 35 U.S.C. §103(a) as obvious over the combined teachings of U.S. Patent No. 5,388,635 to Gruber et al. (hereinafter “Gruber”) and U.S. Patent No. 5,761,037 to Anderson et al. (hereinafter “Anderson”). The Applicants respectfully disagree.

Gruber is directed to a compliant fluidic coolant hat. Specifically, Gruber teaches a cooling hat for transferring heat from a surface to a flowing fluid. [Gruber, Abstract] However, Gruber does not teach wherein the first of the one or more fingers branches from the inlet channel before the end of the inlet channel. Instead, the asserted first fingers of Gruber (channels 30) all branch from the end of the inlet channel of Gruber (element 28). As a result, Gruber does not teach wherein the first of the one or more fingers branches from the inlet channel before the end of the inlet channel. Accordingly, Gruber does not teach the presently claimed invention.

Anderson is directed to an orientation independent evaporator. Specifically, Anderson teaches the evaporator includes a wicking member which possesses a number of surface accessible channels at right angles to one another. [Anderson, Abstract] However, Anderson does not teach wherein the first of the one or more fingers branches from the inlet channel before the end of the inlet channel. Instead, Anderson is only cited for the purpose of teaching a heat exchanging layer 103 of sintered copper bonded to a conducting portion 104. Accordingly, Anderson does not teach the presently claimed invention.

Thus, because neither Gruber nor Anderson teach wherein the first of the one or more fingers branches from the inlet channel before the end of the inlet channel, nor can their combination.

The independent Claim 1 is directed to a heat exchanger comprising: a body having a conducting portion configured to be configured to conduct heat from the heat source to a heat exchanging layer configured within the body, the body including at least one inlet port and at least one outlet port, wherein the at least one inlet port directs fluid from an inlet channel coupled to the at least one inlet port to a first of one or more fingers, a second of one or more fingers, or both of the first and the second of one or more fingers, wherein the first of the one or more fingers branches from the inlet channel before the end of the inlet channel, wherein the second of the one or more fingers branches from the first of the one or more fingers before the end of the first of the one or more fingers, so that the fluid is able to flow from the first of the one or more fingers to the second of the one or more fingers to the heat exchanging layer via an intermediate layer with a plurality of conduits which extend therethrough, wherein at least a portion of one of the first of the one or more fingers is nonparallel to a portion of the second of the one or more fingers, the heat exchanging layer includes a porous microstructure disposed thereon and is configured to distribute the fluid and to pass the distributed fluid therethrough. As described above, the combination of Gruber and Anderson does not teach wherein the first of the one or more fingers branches from the inlet channel before the end of the inlet channel. For at least these reasons, Claim 1 is allowable.

Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130, 132-134 are dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 are all also allowable as being dependent upon an allowable base claim.

The independent Claim 135 is directed to a heat exchanger. The heat exchanger comprises a top manifold layer having a top surface and a bottom surface substantially parallel to the top surface, the top manifold layer comprising an inlet port for passage of a fluid, and a main inlet channel extending therefrom for allowing the fluid to pass therethrough a plurality of primary fingers branching from the main inlet channel, wherein at least one of the primary fingers branch from the main inlet channel before the end of the main inlet channel, and further wherein at least one of the primary fingers has a conduit for allowing the passage of the fluid through the bottom surface of the top manifold layer, an outlet port for the passage of the fluid, and a main outlet channel extending therefrom for allowing the fluid the pass therethrough and a plurality of secondary fingers branching from the primary fingers, wherein at least one of the

secondary fingers branch from the primary fingers before the end of the primary finger, and further wherein at least one of the secondary fingers has an outlet conduit for allowing passage of the fluid through the bottom surface of the manifold, wherein the main inlet channel, the primary fingers, the main outlet channel and the secondary fingers all lie in the same plane, an intermediate layer, having a first intermediate surface and a second intermediate surface, coupled to the bottom surface of the manifold layer, the interface layer having openings corresponding to the inlet conduit and the outlet conduit and a heat exchanging layer coupled to the second surface of the intermediate layer, the heat exchanging layer including a porous microstructure disposed thereon and configured to distributed the fluid and to pass the distributed fluid therethrough. As described above, the combination of Gruber and Anderson does not teach wherein the first of the one or more fingers branches from the inlet channel before the end of the inlet channel. For at least these reasons, Claim 135 is allowable.

Within the Office Action, Claims 1, 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132-135 are rejected under 35 U.S.C. §103(a) as obvious over the combined teachings of Gruber, Anderson and Chu (of record) or Frey (of record). The Applicants respectfully disagree.

Chu or Frey also do not teach wherein the first of the one or more fingers branches from the inlet channel before the end of the inlet channel. For at least these reasons, Claims 1 and 135 are allowable. Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 to 134 are dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 to 134 are all also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 1, 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132-135 are rejected under 35 U.S.C. §103(a) as obvious over the combined teachings of Gruber/Anderson or Gruber/Anderson/Chu/Frey as applied to claims 1, 8, 10, 12-14, 17, 19, 32, 38, 40, and 128-132 above and further in view of either Hou (of record) or Messina (of record). The Applicants respectfully disagree.

Hou and Messina also do not teach wherein the first of the one or more fingers branches from the inlet channel before the end of the inlet channel. For at least these reasons, Claims 1 and 135 are allowable. Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 to 134 are dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim,

Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 to 134 are all also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claim 16 is rejected under 35 U.S.C. §103(a) as being unpatentable over the combined teachings of Gruber/Anderson alone or Gruber/Anderson/Chu/Frey alone or in view of Hou or Messina as applied to claim 1 above, and further in view of Herrell (of record). The Applicants respectfully disagree.

Claim 16 is dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claim 16 is also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 29-32 are rejected under 35 U.S.C. §103(a) as being unpatentable over the combined teachings of Gruber/Anderson alone or Gruber/Anderson/Chu/Frey alone or in view of Hou or Messina as applied to claim 1 above, and further in view of Tonkovich (of record). The Applicants respectfully disagree.

Claims 29-32 are dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claims 29-32 are also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 1, 8, 10, 12-14, 17, 19, 29-32, 38, 40, 128-130 and 132-135 are rejected under 35 U.S.C. §103(a) as obvious over the combined teachings of Gruber in view of the Jiang (of record). The Applicants respectfully disagree.

Jiang also does not teach wherein the first of the one or more fingers branches from the inlet channel before the end of the inlet channel. For at least these reasons, Claims 1 and 135 are allowable. Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 to 134 are dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 to 134 are all also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 1, 8, 10, 12-14, 17, 19, 29-32, 38, 40, 128-130 and 132-135 are rejected under 35 U.S.C. §103(a) as obvious over the combined teachings of Gruber in view of Jiang and Chu or Frey. The Applicants respectfully disagree.

Jiang, Chu or Frey also do not teach wherein the first of the one or more fingers branches from the inlet channel before the end of the inlet channel. Accordingly, Claims 1 and 135 are allowable over Jiang, Chu and Frey. Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 to 134 are dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 to 134 are all also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 1, 8, 10, 12-14, 17, 19, 29-32, 38, 40, 128-130 and 132-135 are rejected under 35 U.S.C. §103(a) as obvious over the combined teachings of Gruber in view of O'Neill (of record) and Tonkovich. The Applicants respectfully disagree.

O'Neill and Tonkovich also do not teach wherein the first of the one or more fingers branches from the inlet channel before the end of the inlet channel. Accordingly, Claims 1 and 135 are allowable over O'Neill and Tonkovich. Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 to 134 are dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 to 134 are all also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 1, 8, 10, 12-14, 17, 19, 29-32, 38, 40, 128-130, and 132-135 are rejected under 35 U.S.C. §103(a) as obvious over the combined teachings of Gruber in view of O'Neill and Tonkovich, and Chu or Frey. The Applicants respectfully disagree.

O'Neill and Tonkovich and Chu or Frey also do not teach wherein the first of the one or more fingers branches from the inlet channel before the end of the inlet channel. Accordingly, Claims 1 and 135 are allowable over the teachings of O'Neill, Tonkovich, Chu and Frey. Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 to 134 are dependent on independent Claim 1. Since independent Claim 1 is an allowable base claim, Claims 8, 10, 12-14, 17, 19, 32, 38, 40, 128-130 and 132 to 134 are all also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 41 and 44 are rejected under 35 U.S.C. §103(a) as obvious over any of the prior art references as applied to Claim 1 above, and further in view of Cardella, of record. The Applicants respectfully disagree.

Claims 41 and 44 are dependent on independent Claim 1. Since independent Claim 135 is an allowable base claim, Claims 41 and 44 are both also allowable as being dependent upon an allowable base claim.

Conclusion

For the reasons given above, the Applicants respectfully submits that the claims are in a condition for allowance, and allowance at an early date would be appreciated. If the Examiner has any questions or comments, the Examiner is encouraged to call the undersigned at (408) 530-9700 so that any outstanding issues can be expeditiously resolved.

Respectfully submitted,
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Dated: February 14, 2012

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